

WHAT IS CLAIMED IS:

1           1. An abrasive comprising a slurry comprising  
2 a medium and cerium oxide particles dispersed in said medium  
3 constituted of at least two crystallites and having crystal  
4 grain boundaries.

1           2. The abrasive according to claim 1, wherein said  
2 cerium oxide particles having crystal grain boundaries have  
3 diameter with a middle value of from 60 nm to 1,500 nm.

1           3. The abrasive according to claim 1, wherein said  
2 cerium oxide particles having crystal grain boundaries have  
3 diameter with a middle value of from 100 nm to 1,200 nm.

1           4. The abrasive according to claim 1, wherein said  
2 cerium oxide particles having crystal grain boundaries have  
3 diameter with a middle value of from 300 nm to 1,000 nm.

1           5. The abrasive according to any one of claims 1 to  
2 4, wherein said crystallites have diameter with a middle  
3 value of from 5 nm to 250 nm.

1           6. The abrasive according to any one of claims 1 to  
2 4, wherein said crystallites have diameter with a middle  
3 value of from 5 nm to 150 nm.

1           7. The abrasive according to claim 4, wherein said  
2 crystallites have diameter with a middle value of from 10 nm  
3 to 50 nm.

1           8. The abrasive according to claim 4, wherein said  
2 crystallites have diameter with a middle value of from 50 nm  
3 to 200 nm.

1           9. The cerium oxide abrasive according to any one of  
2 claims 1 to 8, wherein said cerium oxide particles having  
3 crystal grain boundaries have a maximum diameter not larger  
4 than 3,000 nm.

1           10. The cerium oxide abrasive according to any one  
2 of claims 1 to 9, wherein said crystallites have a maximum  
3 diameter not larger than 600 nm.

1           11. An abrasive comprising a slurry comprising a  
2 medium and abrasive grains having pores which are dispersed  
3 in said medium.

1           12. The abrasive according to claim 11, wherein said  
2 abrasive grains have a porosity of from 10% to 30% as  
3 determined from the ratio of a true density measured with a  
4 pycnometer to a theoretical density determined by X-ray  
5 Rietvelt analysis.

1           13. The abrasive according to claim 11 or 12,  
2 wherein said abrasive grains have a pore volume of from 0.02  
3  $\text{cm}^3/\text{g}$  to 0.05  $\text{cm}^3/\text{g}$  as measured by the B.J.H. method.

1           14. The abrasive according to any one of claims 11  
2 to 13, wherein said abrasive grains are cerium oxide  
3 particles.

1           15. An abrasive comprising a slurry comprising a  
2 medium and dispersed therein cerium oxide particles having a  
3 bulk density not higher than 6.5  $\text{g}/\text{cm}^3$ .

1           16. The abrasive according to claim 15, wherein  
2 said bulk density is from 5.0  $\text{g}/\text{cm}^3$  to 5.9  $\text{g}/\text{cm}^3$ .

1           17. The cerium oxide abrasive according to any one  
2 of claims 1 to 16, wherein said medium is water.

1           18. The cerium oxide abrasive according to any one  
2 of claims 1 to 17, wherein said slurry contains a  
3 dispersant.

1           19. The cerium oxide abrasive according to claim 18,  
2 wherein said dispersant is at least one selected from a  
3 water-soluble organic polymer, a water-soluble anionic  
4 surfactant, a water-soluble nonionic surfactant and a

5 water-soluble amine.

1 20. The cerium oxide abrasive according to claim 19,  
2 wherein said dispersant is a polyacrylic acid type polymer.

1 21. The abrasive according to claim 1, wherein;  
2 cerium oxide particles with a diameter not smaller  
3 than 1  $\mu\text{m}$  occupies at least 0.1% by weight of the total  
4 weight of the cerium oxide particles; and  
5 said cerium oxide particles having crystal grain  
6 boundaries have the nature of polishing a target member  
7 while collapsing.

1 22. The abrasive according to claim 1, wherein said  
2 cerium oxide particles having crystal grain boundaries have  
3 the nature of polishing a target member while forming new  
4 surfaces not coming into contact with any medium.

1 23. The abrasive according to claim 1, wherein the  
2 content of cerium oxide particles having a particle diameter  
3 not smaller than 0.5  $\mu\text{m}$  after polishing, measured by  
4 centrifugal sedimentation after a target member has been  
5 polished, is in a ratio of not more than 0.8 with respect to  
6 that content before polishing.

1 24. The abrasive according to claim 1, wherein

2 cerium oxide particle diameter at D99% by volume measured by  
3 laser diffraction after a target member has been polished is  
4 in a ratio of from 0.4 to 0.9 with respect to that particle  
5 diameter before polishing.

1 25. The abrasive according to claim 1, wherein  
2 cerium oxide particle diameter at D90% by volume measured by  
3 laser diffraction after a target member has been polished is  
4 in a ratio of from 0.7 to 0.95 with respect to that particle  
5 diameter before polishing.

1 26. A method of polishing a target member,  
2 comprising polishing a target member by the use of the  
3 abrasive according to any one of claims 1 to 25.

1 27. The method of polishing a target member  
2 according to claim 26, wherein said target member has a  
3 strength higher than the grain boundary breaking strength of  
4 the cerium oxide particles.

1 28. The method of polishing a target member  
2 according to claim 26, wherein said target member is a  
3 semiconductor chip on which a silica film has been formed.

1 29. A process for producing a semiconductor device,  
2 comprising the step of polishing a semiconductor chip on

3 which a silica film has been formed, by the use of the  
4 abrasive according to any one of claims 1 to 25.

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